CLAIMS

What is claimed is:

1. A process for mono-alkylating at least one monocyclic aromatic hydrocarbon comprising reacting the monocyclic aromatic hydrocarbon with at least one α-olefin having from 4 to 20 carbon atoms in the presence of an anhydrous alkane sulfonic acid at a temperature below about 280° F.

2. The process of claim 1 wherein the reaction temperature is in the range of from about 180° F to about 280° F.

3. The process of claim 1 wherein the monocyclic aromatic hydrocarbon is selected from the group consisting of benzene, toluene, *o*-xylene, *m*-xylene, *p*-xylene, hemimellitene, pseudocumene, mesitylene, prehnitene, isodurene, pentamethylbenzene, ethylbenzene, *n*-propylbenzene, cumene, *n*-butylbenzene, isobutylbenzene, *sec*-butylbenzene, *tert*-butylbenzene, *p*-cymene, biphenyl, diphenylmethane, triphenylmethane, 1,2-diphenylethane, styrene, *trans*-stilbene, *cis*-stilbene, *unsym*-diphenylethylene, triphenylethylene, tetraphenylethylene, phenylacetylene, and diphenylacetylene.

4. The process of claim 3 wherein the monocyclic aromatic hydrocarbon is selected from the group consisting of benzene, toluene, *o*-xylene, *m*-xylene, *p*-xylene, and mixtures thereof..

5. The process of claim 4 wherein the monocyclic aromatic hydrocarbon is *o*-xylene.

6. The process of claim 1 wherein the α-olefin is selected from the group consisting of 1-decene, 1-dodecene, 1-tetradecene, 1-hexadecene, and 1-octadecene.

7. The process of claim 6 wherein the α-olefin is 1-dodecene.

8. The process of claim 1 wherein the alkyl moiety of the anhydrous alkane sulfonic acid is one of from one to four carbon atoms.

9. The process of claims 8 wherein the anhydrous alkane sulfonic acid is anhydrous methane sulfonic acid.

10. The process of claim 1 wherein the reaction between the the monocyclic aromatic hydrocarbon with an α-olefin is initiated at a temperature in the range of from about 180 to about 200° F.

11. The process of claim 10 wherein, after initiation, the reaction temperature is maintained at a temperature in the range of from about 250 to about 270° F until alkylation is complete.

12. A process for mono-alkylating *o*-xylene comprising:

A) mixing *o*-xylene, 1-dodecene, and anhydrous methane sulfonic acid in a reaction vessel;

B) initiating a reaction between the *o*-xylene and 1-dodecene by heating the

contents of the reaction vessel to a temperature in the range of from about 180 to about 200° F; and

C) maintaining the contents of the reaction vessel, after initation, at a temperature in the range of from about 250 to about 270° F until alkylation is complete.